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Hurricanes and Gasoline Prices

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The Gulf of Mexico, especially the coastlines of Texas and Louisiana, have borne the brunt of many of the most severe hurricanes to hit the United States in recent years. The high winds, heavy rains, and storm surges that constitute a hurricane have resulted in loss of life, flooding, property damage, and economic disruption. In addition, this area includes important oil industry resources including offshore production facilities, refineries, and transportation infrastructure including import and export shipping facilities and pipelines.

Hurricanes Ike, which made landfall in Texas on September 13, 2008; Rita, which made landfall in Texas on September 24, 2005; and Katrina, which made landfall in Louisiana on August 29, 2005, all affected the oil industry. Currently, Hurricane Harvey, which made landfall on August 26, 2017, in Texas, threatens similar disruptions as a result of oil production curtailment, refinery closures, and damaged facilities.

Other variables, including wind speed, specific location, and flooding, determine the damage a hurricane might cause. Location is of key importance with respect to specific facilities like oil refineries because hurricane conditions can vary widely over a relatively limited area. Flooding is important because some large refineries are located on, or near, the water to facilitate access to ship-borne crude oil deliveries. Workforce issues also are important to facility closure decisions.

Gulf Coast Refineries

In 2017, Texas is home to 30 oil refineries, of which 29 are in operation. These refineries have a calendar-day capacity of about 5.7 million barrels per day (mmb/d), or about 30% of total U.S. refinery capacity. Louisiana has 18 refineries, all operating, with a calendar-day capacity of about 3.3 mmb/d, about 18% of total U.S. refinery capacity. These refineries are important because they not only supply gasoline and other petroleum products to their local markets and adjacent states, but they are linked to other major consuming areas in the nation by pipelines and other transportation modes. As a result, supply disruptions in Texas can, and likely will, have observable price effects in other regions, including the Northeast and Mid-Atlantic.

Gasoline Prices

While each of the four hurricanes identified in this Insight has unique characteristics with respect to their effects on gasoline prices, they also exhibit similarities. The most basic similarity between the hurricanes is that they all caused disruptions in gasoline production, reducing available supply. A reduction in supply suggests that gasoline prices may increase. This behavior was observed with respect to each storm, but

with somewhat differing time dynamics. Energy Information Administration spot price data was used in this section of the Insight.

The price of regular gasoline at the U.S. Gulf Coast on August 29, 2005, the day Katrina made landfall, was $2.01 per gallon, up from the previous week when it averaged $1.83 per gallon. Over the next three days, August 30 through September 1, the price of gasoline averaged $2.87 per gallon. Over the next five days, gasoline prices declined, averaging $2.23 per gallon, and by September 12, the price was below the August 29 level at $1.93 per gallon. This price behavior suggests some market anticipation of a supply disruption/shortage, followed by a quick upward price spike, with a movement back to normalcy within a few weeks.

The price of regular gasoline at the U.S. Gulf Coast on September 23, 2005, the last trading day before Rita made landfall, was $2.44 per gallon, up from the previous week when it averaged $1.84 per gallon. Over the next three days, September 26 through September 28, the price of gasoline averaged $2.87 per gallon. Over the next five days, gasoline prices declined, averaging $2.31 per gallon, and were near the pre-hurricane level, at $1.88 per gallon by October 7. The pricing dynamic following Rita was similar to that following Katrina, but this comparison does not include interactive effects that might be present because of the close timing of the two storms. In addition, abstracting from the general time trend of prices based on longer-term demand-and-supply conditions could distort results.

The price of regular gasoline at the U.S. Gulf Coast on September 15, 2008, the first trading day after Ike made landfall, was $4.63 per gallon, up from the previous week when it averaged $3.66 per gallon. Over the next three days, September 16 through September 18, the price of gasoline averaged $2.99 per gallon. Over the next five days gasoline prices declined, averaging $2.77 per gallon. Gasoline price behavior associated with Ike was characterized by a more rapid anticipatory price increase, followed by a more rapid decline in prices.

The price of regular gasoline at the U.S. Gulf Coast on August 21, 2017, the most recent reported data, was $1.55 per gallon, much the same as the previous week. However, this was four days before Harvey made landfall and moved into the Houston area. It is likely that prices will rise over the next week as it has been reported that the storm has resulted in about 15% of U.S. refining capacity being shut down. Price increases could be enhanced by the relatively low levels of finished gasoline stocks available. Hurricane Harvey seems to have resulted in less anticipatory price effects than Katrina, Rita, and Ike, likely related to the relatively short time in which the storm increased from a tropical storm to a Category 4 hurricane. It is unknown how long Hurricane Harvey will affect the refining industry in the Houston area, the extent of damage, or how long it will take to return to normal operations.

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